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ABSTRACT

The purpose of this paper is to review research in the general area of linguistic abilities that might have relevance to the selection and training of translators and interpreters. An important issue to be addressed is what is the criterion of success, that is, how can success in translation and interpretation be measured? The procedures used in examining candidates for study at the Georgetown University Division of Interpretation and Translation are described in an attempt to arrive at criteria. The directors of this training program suggest that there would be differences among candidates, even if well qualified in linguistic knowledge, in amenability to, and success in, training. This paper offers speculations on what the dimensions of these differences might be, based on the considerable amount of research that is now available about verbal abilities and other traits that might have relevance to performance in foreign language translation and interpretation. (Author/CFM)

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# Linguistic Abilities in Translators and Interpreters

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[For NATO Symposium: Language Interpretation and Communication, Venice, Italy, 26 September-1 October, 1977]

My purpose is not to report any results of empirical research on linguistic abilities in translators and interpreters, for I have never had the opportunity to do any such research, but to review research in the general area of linguistic abilities that might have relevance to the selection and training of translators and interpreters. As I understand the purpose of this symposium, it is to bring research workers in psycholinguistics together with practitioners in language translation and interpretation, with the hope that new research directions can be defined.

I cannot claim any great familiarity with problems of translation and conference interpretation, except that I, like many scientists who attend international meetings, have observed conference interpreters at work and have been impressed with their efforts, although in the nature of things it is usually difficult for a conference participant, even if he knows the language being translated, to know just how well they perform that work. This raises one of the first issues that would occur in any empirical

work on the selection and training of translators and interpreters: what is the criterion of success, that is, how can success in translation and interpretation be measured? In the case of translation (i.e., written translations), what kinds of measures of accuracy and effectiveness could be obtained? In the case of conference interpretation, could conference participants (not being able to understand the language from which the interpretation is made) provide any reliable and valid judgments of the success of the performance? Or could success be measured only by a detailed comparative analysis of the input and output messages?

I suppose that this problem of defining the criterion has been faced, in one form or another, both by practitioners and by research workers in the field, but I am unaware of any thoroughgoing study of the matter. It may, however, be pertinent for me to mention a small contribution that I have made to evaluating the quality of translations. This was in connection with a policy committee (the Automatic Language Processing Advisory Committee) of the National Academy of Sciences that sought to evaluate whether machine translation algorithms available in the middle 1960s were capable of producing useful translations of Russian scientific writings. My procedures involved a sentence-by-sentence analysis of (Russian) input and (English or quasi-English) output messages. Two measures were employed: first, output sentences were evaluated by a panel of judges on a 9-point scale for "intelligibility"; next, a very carefully-made translation of the input message was presented to the subjects, who then made a

judgment of the degree to which the careful translation was "informative," i.e., reduced any uncertainty inherent in the output sentence. The judges did not know Russian. Output sentences came from three different machine translation algorithms, but also from three human translators. These measures differentiated the quality of the three machine translations, but they also differentiated the quality of the three human translations, which were done under the normal conditions under which human translators work (Carroll, 1965-66, 1966). No one of the three "normal" human translations was quite as good as the "careful" translation. I would think that procedures similar to these might serve to provide measures of the quality of conference interpretations, although they do have the disadvantage of requiring a sentence-by-sentence analysis, the availability of a very careful translation, and a panel of judges. Actually, it is moot whether it is necessary to have the careful translation as a basis for the judgments of "informativeness," since the ratings of "intelligibility" were highly correlated (negatively) with the ratings of "informativeness." This finding encourages me to think that judgments of the output of conference interpreters might be highly reliable and valid even without any consideration of the accuracy of that output as translation of the input.

It is not within the scope of this paper, however, to consider the problem of defining and measuring success in translation and interpretation, but I do not see any paper specifically devoted to that topic on the conference program. Probably it is a topic that will come up in various connections,

however; certainly it is one that merits careful and thorough investigation, since any empirical research in the selection and training of translators or interpreters will require the availability of a criterion of success.

I made some effort to inquire into methods of selecting persons for training in translation and interpretation, but my resources were somewhat limited since there are few schools of translation and interpretation in the United States. In April 1977 I spent a day at the Division of Interpretation and Translation in the School of Languages and Linguistics at Georgetown University, Washington, D. C., observing procedures in examining candidates for study in that division. The Division offers two distinct Certificate programs, one in translation and one in interpretation. The interpretation program is a full-time, two semester course. Entrance examinations are given six times a year, and I was privileged to observe these examinations on one occasion.

The entrance examination consists of several procedures, depending partly on what the candidate is applying for. Written translation exercises are given in both directions over the candidate's two languages (or several languages, in some cases), the candidate not being allowed to use a dictionary in at least some of these exercises. I did not directly observe the translation examinations, but believe I can make fair inferences about the nature of those examinations. The oral examination is conducted individually in the presence of several examiners. The standard procedure is to start by giving the applicant a text

in his passive language, to be translated orally at sight. Texts are passages of moderate difficulty from magazine articles, speeches given at international conferences, etc. Next, the applicant is asked to render in his or her own words, in the active language, the content of what has just been translated. Then the applicant (if indeed he or she has done well enough to get this far) is asked to listen to a spontaneous, "live" discourse (of 3 to 5 minutes duration) given by one of the examiners, in the passive language. The applicant is encouraged to take notes on this discourse while it is being delivered; then the applicant is asked to give an oral consecutive translation. Finally, the applicant is asked to deliver, in a language of his choice, an oral discourse or argument on some topic, usually, a rebuttal of the discourse that has just been heard. (Frequently, applicants are in effect asked to deliver speeches supporting views that they are probably in disagreement with, e.g., a speech supporting colonialism, in rebuttal to a speech that is critical of colonialism.)

The whole interview is conducted in a highly informal manner, to put the applicant at ease. The examiners may intersperse the examination procedure with conversations concerning the applicant's educational background, foreign language training, expectations regarding training and employment as a conference interpreter, etc.

Over a period of about 6 hours, I observed the oral examinations of 11 candidates (about a half-hour per candidate, but the durations varied widely since some candidates with obviously poor

qualifications were dismissed after only a few minutes, and other candidates were kept under examination for nearly an hour). It was evident that the major purpose of the oral examination was to assess the applicant's knowledge of the respective languages, his fluency in speaking the active language, his demeanor in speaking (voice quality, directness of gaze, tempo, freedom from hesitation), his ability to comprehend and remember the content of a discourse, and the agility of his mind in shaping an elegant rendering of a discourse in another language.

What surprised me was the poor qualifications of many of the applicants. (Since I have at least reasonable competence in several of the languages involved, I was able in most cases to judge the candidates' expertise in giving accurate sight translations of written materials, and to judge the quality of their consecutive translations of spoken discourses.) Many of the applicants seemed to have only a relatively elementary knowledge of their passive language, with large gaps in their knowledge of both vocabulary and grammar. Even those who were able to exhibit good knowledge of the language from which they had to translate seemed to have much trouble in expressing themselves competently and gracefully in their active language. On the whole I got the impression that most of the applicants not only had poor knowledge of the second language or languages they claimed to know, but also had immature knowledge of their native language and inadequate skill in expressing themselves in it.

Perhaps I should not have been as surprised as I was about

the poor foreign language qualifications of most of the applicants who presented themselves at the Georgetown University examinations. I should have remembered that in an extensive survey of foreign-language attainments of senior college students majoring in a foreign language in U. S. colleges and universities (Carroll, 1967a, 1967b), relatively small proportions of these students were found to have attained the levels of foreign language knowledge that I would think would be required for training as translators and interpreters. I do not know how matters stand in countries outside the United States, but I gather from at least one survey of attainment in German in the United Kingdom, paralleling my U. S. study (Gomes da Costa, Smith, & Whiteley, 1975), the foreign language attainments of foreign language specialists emerging from universities are not always impressive. It would appear that the pool of individuals with sufficient qualifications in foreign languages to merit training as translators and interpreters is relatively small in many countries. The smallness of this pool will present a practical difficulty in the conduct of any empirical research that might be done on the selection and training of translators and interpreters.

The interviews I observed at Georgetown University permitted some assessment of applicants' characteristics besides their knowledge of foreign languages--their mastery of their native language, their general level of educational background, their fluency and readiness to express themselves, and their speech mannerisms. Since very few of the applicants I observed had

adequate foreign language knowledge, however, it was impossible for me to judge whether any assessments that might have been made of applicants' characteristics other than their foreign language skills could have been either accurate or relevant to training in translation and interpretation. In talking with the directors of the Georgetown University training program, David and Margareta Bowen, I got the impression that they felt that there would be differences among candidates, even if well qualified in linguistic knowledge, in amenability to, and success in, training. In the remainder of this paper, I want to offer speculations on what the dimensions of these differences might be, based on the considerable amount of research that is now available about verbal abilities and other traits that might have relevance to performance in foreign language translation and interpretation.

It will be necessary to consider various aspects of performance in translation and interpretation. I assume that the situations that might have to be considered would include the following more or less distinct types:

(1) Careful written translation. This would involve the preparation of appropriate translations of any of a wide variety of genres of materials: fiction and non-fiction, newspaper and magazine writing, official documents, scientific articles, manufacturer's guides and instruction books, etc., up to the point of formal publication. The translator would take his time and use whatever materials (dictionaries, reference works, specialized publications, etc.) he might deem necessary.

(2) Quick, informal written translation. Here, the translator works under at least a moderate time pressure and has limited opportunity to perfect his translation through use of reference materials; the purpose of the translation is mainly to give the user an approximate idea of the content of the original material, and it is usually assumed that the user already has any specialized background that is necessary to comprehend that content. Frequently, in this case, the translator dictates a "sight" translation into a recording machine, with limited editing of the transcription.

(3) Consecutive conference interpretation. The interpreter listens to, and (optionally) takes written notes on, short segments of a discourse, and gives a rendering in another language after each segment.

(4) Simultaneous conference interpretation. Usually this occurs in a specially designed booth in which the interpreter listens to a discourse through earphones and renders his translation by speaking into a microphone as the input discourse proceeds. Sometimes the interpreter has available an approximate text in the source language, and may have an opportunity to review it before the discourse is actually delivered.

Different patterns of aptitudes and skills would, I suppose, be relevant for these four types of situations, but all require a high degree of verbal intelligence and general culture. Mere knowledge of a foreign language, and skill in understanding, speaking, reading, and writing it, does not insure that the individual has the degree of verbal intelligence that is required

for translation and interpretation. It would likewise not insure that the individual has the educational background, and general culture, that would be demanded.

If I were asked to propose a battery of formal tests for selection of personnel for translation and interpretation training, the battery would certainly include, besides tests of foreign language skills, tests of verbal intelligence and culture in the native language.

Psychologists have proposed various models and theories of intelligence. Up until about 1935, the dominant model was that proposed by Charles Spearman, the British psychologist, who emphasized the importance of what he called "g" or general intelligence (Spearman, 1927). With the advent of more sophisticated mathematical models for analyzing cognitive ability tests, Thurstone (1938) proposed analyzing cognitive abilities into a series of "primary factors," including several that had relevance to verbal performances. Of these, the factor usually identified as "V," or "verbal intelligence," is probably most relevant to performance as an interpreter or translator. In a more detailed study of the V factor, I (Carroll, 1941) identified it as representing "differences in the stock of linguistic responses possessed by the individual--the wealth of the individual's past experience and training in the English language." But for "English language," one may equally well read, "native language." The tests appearing on the V factor in the author's study were such as to suggest that the verbal factor involves not only the individual's knowledge of advanced vocabulary, but also his

sensitivity to established word usages, to the nuances of idiomatic phrases, and even his ability to predict the transitional probabilities of words in phrases, as in a test called Phrase Completion, wherein the subject was required to complete phrases like "As for _____," with the responses scored in terms of the frequency with which they were used by other respondents. The verbal factor is one of the best and most easily established factors of intelligence. It is involved not only in tests of vocabulary knowledge, but also tests of reading comprehension, ability and facility (speed) in detecting semantic and syntactic ambiguities, and ability in writing effective, highly-rated themes. It would be my assumption that effective translators and interpreters should be high on this "verbal factor." The verbal factor would be particularly demanded in written translation, where exact verbal expression in the target language would be required, but it could be important in oral interpretation because it would reflect or predict more adequate comprehension of the content of the source message. For practical testing purposes, the verbal intelligence factor is best measured by a wide-range vocabulary test, with emphasis on the exact meanings of the more difficult and rarer words of a language. It may be expected that scores on such a test will be correlated with scores on tests of other aspects of verbal intelligence, such as reading comprehension tests.

Scores on verbal intelligence tests are highly correlated with amount of education, although it cannot be assumed that a diploma from an institution of higher learning will necessarily

be accompanied by high scores on verbal intelligence tests. A test of advanced vocabulary knowledge can be challenging and taxing even for advanced university students, and it is likely to reveal the extent to which the student can accurately comprehend a variety of verbal materials, because students do not ordinarily acquire advanced vocabulary knowledge without extensive and critical reading. From a practical standpoint in using selection tests for translators and interpreters, the issue of whether verbal intelligence has genetic sources is completely irrelevant; the issue is whether the individual has attained the required level, through education and experience.

I would suppose that verbal intelligence would be particularly critical in the selection of personnel for training in careful, written translation, because this type of work makes great demands on the individual's sensitivity to words and their meanings, to appropriate ways of expressing ideas, and to the nuances of verbal argumentation. At the same time, high levels of verbal intelligence would be required in all forms of translation and interpretation work.

Closely related to verbal intelligence, although not ordinarily considered as a factor of mental ability, is general culture and education. Because of the wide variety of subject-matter contexts in which translators and interpreters are required to work I would think that general culture and diverse educational background would be of importance. Breadth of information and culture can be assessed by tests of general educational development. Even if the tests assess nothing more

than the level of factual information that the individual has acquired, they are likely to be predictive of the success of a translator/interpreter in meeting the demands of a wide variety of contexts in humanities, natural and social sciences, commerce and industry, governmental foreign affairs, etc. (No firm recommendations can be made as to tests and examinations currently available. The Cooperative General Culture Test, with scores in social studies, literature, science, fine arts, and mathematics, once available from the Cooperative Test Division of Educational Testing Service, is out of print, but similar tests with pertinent current content could be devised.)

While these tests of verbal intelligence and general culture would be useful in selecting individuals with qualifications for either translation or conference interpreting, the particular kinds of verbal facilities required in either consecutive or simultaneous conference interpret ng, particularly the latter, would provide the most fascination for the psycholinguist interested in linguistic abilities.

Thurstone's model of "primary mental abilities" provides little scope for the study of <u>productive</u> verbal abilities. His studies disclosed what he called a W or "word fluency' factor, measured by various tests designed to explore the individual's ability to manipulate orthographic materials to create lists of words, for example to think of words that begin with a certain letter and end with another letter, or that begin with a certain prefix (like <u>pre</u>-) or end with a certain suffix (like -<u>ness</u>). Psychologists have been unsuccessful in showing, however, that

this type of test has anything to do with fluency in speaking, and the relevance of whatever ability is measured by such tests to any kind of creative activity has always been in doubt. Later studies (e.g. by Taylor, 1947; Taylor, Ghiselin, & Yagi, 1967) have disclosed, besides the "Word Fluency" factor, three other factors of individual differences in verbal fluency: Ideational Fluency, Expressional Fluency, and Associative Fluency. All these factors involve speed in producing a variety of verbal responses under particular constraints, and in this light one might consider that they would possibly be involved in the kind of rapid-fire verbal production required in simultaneous conference interpreting. In the manual for a kit of factor tests published by Educational Testing Service in 1963 (French, Ekstron & Price, 1963), the following information about these factors was given:

Ideational Fluency: defined as "the facility to call up ideas wherein quantity and quality of idea is emphasized," this factor was measured by a Topics test requiring the subject to write as many ideas as possible on a given subject (e.g., "a man climbing up a ladder,"), Theme, which asks the subject to write as long a composition as possible on a topic, and Things Category, which asks the subject to list as many items as possible that are alike in some way, e.g. things that are round.

Expressional Fluency: defined as "the ability to think rapidly of appropriate wording for ideas," this factor was measured by various tests in which the subject was asked to rephrase certain ideas in as many ways as possible or to invent sentences in which

the syntax is in some way constrained.

Associational Fluency: defined as "the ability to produce words from a restricted area of meaning," this factor was measured by tests requiring subjects to write, in a brief period of time, as many synonyms or antonyms as possible for given words.

It should be noted, however, that existing tests of these fluency factors are practically all written tests in which sheer writing speed may play a part. There has been relatively little investigation of these fluency factors in situations involving oral production. Taylor et al. (1967) studied various fluency tests, some requiring oral production, and found their scores related to success in such activities as instructing others, conducting conferences and interviews, and writing reports. Cattell (1971) and others have claimed that the fluency factors are also related to certain personality traits, such as "extraversion" and "exuberance." I understand that simultaneous conference interpreters often have the reputation of being out-going, extraverted, exuberant persons. Thus it would appear that investigations of the linguistic abilities and personalities of interpreters might well employ tests of the various fluency factors, both in oral and written modes. Performance on fluency tests, incidentally, is relatively independent of verbal intelligence; even when individuals are asked to give large numbers of synonyms to given words, their productions do not depend upon large vocabularies, but rather on speed and facility in retrieving the many relatively common words that meet the requirements of this task.

Interestingly, Ekstrom, in a review of recent literature on factors of cognitive ability, remarked, with regard to the associational fluency factor,

> There appears to be no evidence to suggest that this factor is confined to the English language. It would be interesting to determine if the ability to produce an appropriate word when translating a well-known foreign language would involve associational fluency (1973, p. 25).

One other factor, possibly related to the above-described fluency factors, that is possibly relevant to rapid word-retrieval in a conference-interpreting situation, is the Naming Facility factor, identified by Carroll (1941) and Thurstone and Thurstone (1941, factor $X_3$) and later studied by Carroll (1976b). The Naming factor is tested by tasks in which individuals are asked to retrieve the names for pictured objects as rapidly as possible; the test can be given either in written form (in which the subject is asked to write the first letter of each name, for a long series of pictures) or in oral form, in which reaction time of naming is measured in a specially designed experimental situation in which pictures are presented tachistoscopically. Carroll and White (1973) and Lachman, Shaffer, & Hennrikus (1974) have shown that speed of naming is influenced both by the frequency and the age-of-acquisition of the name, but after adjusting data for name frequency and age-of-acquisition, strong and consistent individual differences remain as determinants of speed of naming. It is entirely possible that properly controlled measurements of naming time, in a given language, would show an

important relationship with success in conference interpreting, since conference interpreting would seem to demand that the performer be able to retrieve words very readily and rapidly.

The research work in the investigation of fluency and naming factors reflects an increasingly emphasized direction in the study of cognitive abilities, namely an emphasis on an "information processing" approach (Carroll, 1976a, Hunt and Lansman, 1975). It is assumed that individuals vary not only in the extent of their cognitive information (in "lexical memory stores") but also in the speed and facility with which they can store, retrieve and manipulate elements of information. Rapid rendering of a message in one language into a message in another language represents what would appear to be a tremendous feat in information processing. One component of that feat seems similar to what has been called "speech shadowing" (Cherry, 1953), i.e., repeating an auditory message aloud, word for word, while listening to it. Speech shadowing with a competing message has been extensively used in various studies of speech perception and selective listening. While shadowing appears to be a task that can be performed fairly easily by most speakers, there are apparently individual differences in the ability to shadow at very short distances. Marslen-Wilson (1973, 1975) was able to identify people who could shadow continuous speech, in the absence of a competing message, at a distance of only a quarter of a second. Tests of ability to shadow at short distances, with increasing speed and complexity of the input message, might be predictive of a person's ability to become an efficient simultaneous interpreter,

even though the average time between input in a given language and output in another language, in simultaneous translation, is probably much longer than one-quarter of a second. I know of no studies in which individual differences in shadowing ability have been studied in relation to other types of verbal abilities.

The shadowing task would involve the input and immediate output of continuous discourse material. With a longer delay of the output, i.e. only at the end of a segment of discourse, the task would resemble the sentence and paragraph recall tasks that have been much studied in experimental psycholinguistics. It would also resemble the task of the consecutive interpreter. Usually, ability to give an accurate immediate verbatim recall of a sentence has been found to correlate with general verbal intelligence; in fact, sentence recall tasks are to be found in such standard intelligence tests as the Stanford-Binet. Ability to give an acceptable rendering, in one's own words, of the gist of a longer passage is also related to general verbal intelligence, but it may also call on special abilities to organize the memory structure, to notice particular types of details in the input message, and to formulate the linguistic structure of the output. There has been little study of individual differences in the <u>oral</u> recall of sentence and paragraph material; most of the studies have involved written recall, or written recognition tests, for example using multiple-choice comprehension questions, and even in these cases the evidence for any kind of special "meaningful memory factor" is unclear (Ekstrom, 1973, pp. 78-79). Cattell (1971) has suggested that meaningful memory ability

represents only a projection of intelligence into memorizing performance. Nevertheless, there are promising possibilities for research into the kinds of meaningful memory abilities that might be required by a consecutive conference interpreter, or that might be trained.

In this review of linguistic abilities that might be relevant in translation and interpretation, I have not mentioned the special kinds of abilities included under what is called foreign language aptitude. In my continuing research in foreign language aptitude (Carroll, 1962, 1973) I have identified certain abilities that seem to make for rapid learning of foreign languages--abilities that I have called "phonetic coding" and "grammatical sensitivity," for example. I doubt, however, that these abilities would be relevant to the prediction of success in translation and interpretation, given that the individuals selected for training in such work would have <u>already</u> attained a high level of competence in one or more languages other than their native language. To the extent that foreign language aptitudes are relevant in learning foreign languages, such individuals would be found to possess whatever level of aptitude that would have been required for their learning. Furthermore, foreign language aptitudes appear to be predictive only of the <u>rate</u> of learning under the kinds of conditions that usually obtain in formal language training; people who learn a foreign language in a bilingual milieu, for example, would not necessarily possess high degrees of foreign language aptitude as measured by aptitude tests.

While research in the aptitudes and abilities required in translation and interpretation work might have considerable practical value in providing means whereby candidates for training could be counseled and guided into particular kinds of work appropriate to their abilities, or discouraged from attempting training at all, my real interest in this type of research would center in what it might reveal about the mental processes of translators and interpreters in performing their tasks. Research in the underlying abilities is, of course, only one way of studying these mental processes, alongside other approaches that rely more on studying the effects of various experimental treatments. Even experimental psychologists, however, have come to recognize the possible value of the psychometric approach to the study of cognitive processes (e.g., Underwood, 1975; Estes, 1974; Hunt and Lansman, 1974).

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